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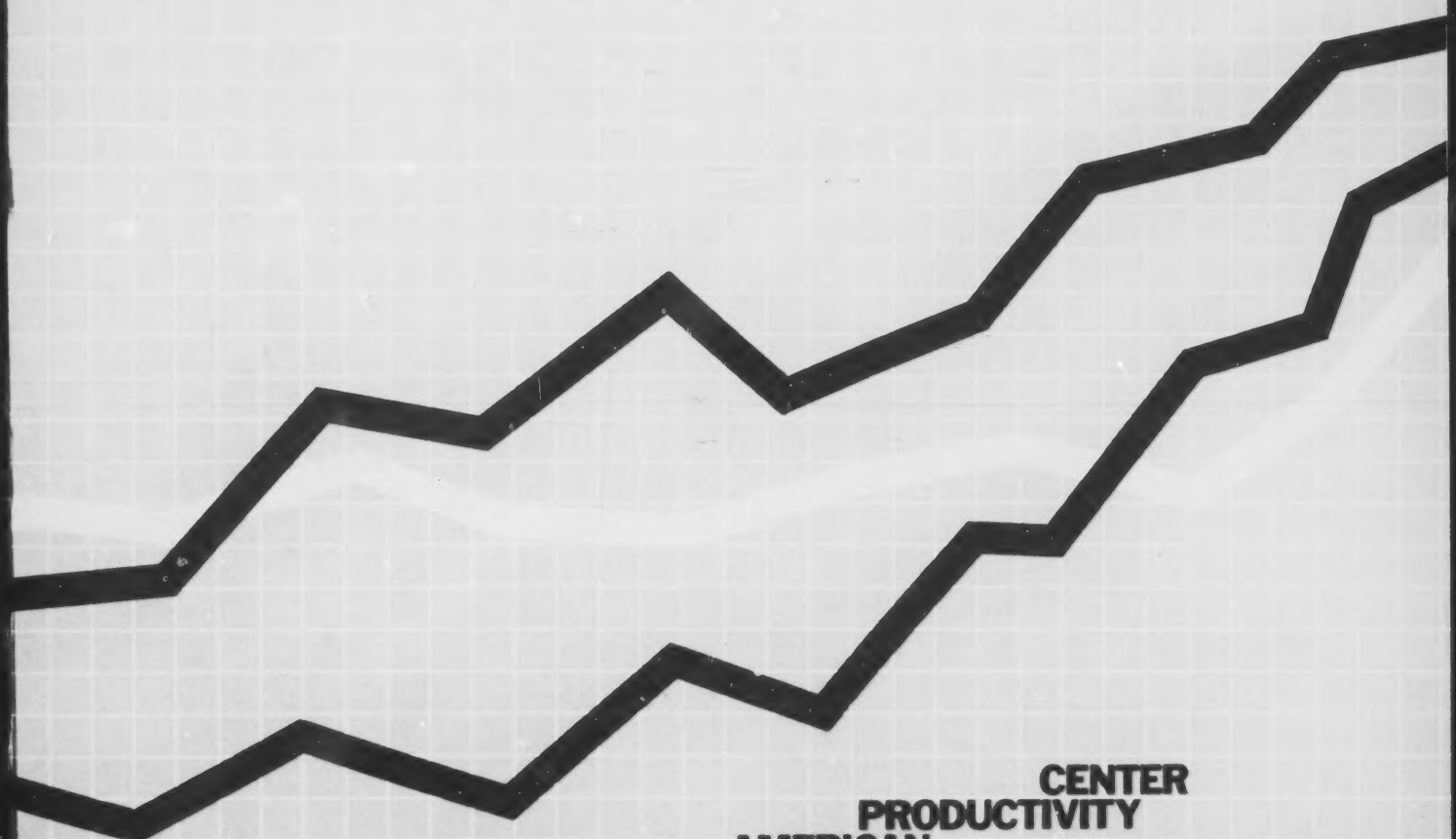
Productivity Perspectives

1983 Edition



AMERICAN PRODUCTIVITY CENTER

TABLE OF CONTENTS

	Page
Introduction	
A New Era? Or the Eye of the Storm?	3
U.S. Productivity in the 1980s	
Capital Productivity	5
Labor Productivity	8
Total Factor Productivity	9
Contributors to United States Performance	
Capital Investment	10
Research and Development	10
Business and Economic Cycles	11
International Productivity Performance	
Productivity Statistics	13
Other Economic Indicators Related to Productivity	15
Appendix	18

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INDEX OF TABLES

Figure	Title	Page
1	Productivity Trends — U.S. Business Economy—Labor, Capital, Total Factor	3
2	Capital Productivity Trends — Major Segments	5
3	Capacity Utilization in Manufacturing (1975-83)	5
4	Capital Productivity Levels — Major Sectors (1982)	6
5	Capital Productivity Levels — Manufacturing Industries (1982)	7
6	Productivity Growth during Economic Recoveries — Labor, Capital, Total Factor	7
7	Labor Productivity Trends — Major Segments	8
8	Labor Productivity Levels — Major Segments (1982)	8
9	Labor Productivity Levels — Manufacturing Industries (1982)	9
10	Total Factor Productivity Trends — Major Segments	9
11	Slippage in Total Factor Productivity — 1948-66 & 1973-79	9
12	U.S. Net Capital Stock — Industry Groups (1970 & 1982)	10
13	R&D as Percentage of GNP (1961-82)	10
14	Components of R&D Expenditures — Basic, Applied, Development	11
15	Performer of R&D—Industry, Federal Government, Universities/Non-profit	11
16	Borrowing as Percentage of GNP	12
17	General Inflation Indicators — GNP Deflator and CPI	12
18	Specific Inflation (1978-82)	12
19	International Productivity Levels GDP/Hour and GDP/Employee	13
20	International Productivity Growth GDP/Hour and GDP/Employee	14
21	International Manufacturing Productivity (1973-82)	14
22	Productivity Trends, United States and Japan (1970-80) Labor, Total Factor for Major Segments	15
23	Relative Levels of Labor Productivity — Major Segments (1980) United States and Japan	15
24	U.S. Dollar-Weighted Exchange Rate (1976-83)	16
25	International Balance of Trade (1982)	16
26	World Economic Factors (1981, 82) — GNP Growth, Inflation, Unemployment	16
27	International R&D as Percentage of GNP (1961-80)	17
28	International Savings and Investment Rates (1982)	17

Appendix

1	Productivity Trends in the U.S. Business Economy	18
2	Capital Productivity Trends for Manufacturing Industries	19
3	Labor Productivity Trends for Manufacturing Industries	19
4	Total Factor Productivity Trends for Manufacturing Industries	20

When economics historians sit down to write the history of the post-OPEC world economy, the year 1983 will in all likelihood be viewed as a watershed. The year 1983 witnessed what appeared to be the first sustained economic recovery since the mid-1970s. The question that remains as the year ends is whether or not this recovery represents a new era in economic and productivity growth or just the eye of another economic storm. The trends depicted in Figure 1 certainly suggest multiple interpretations.

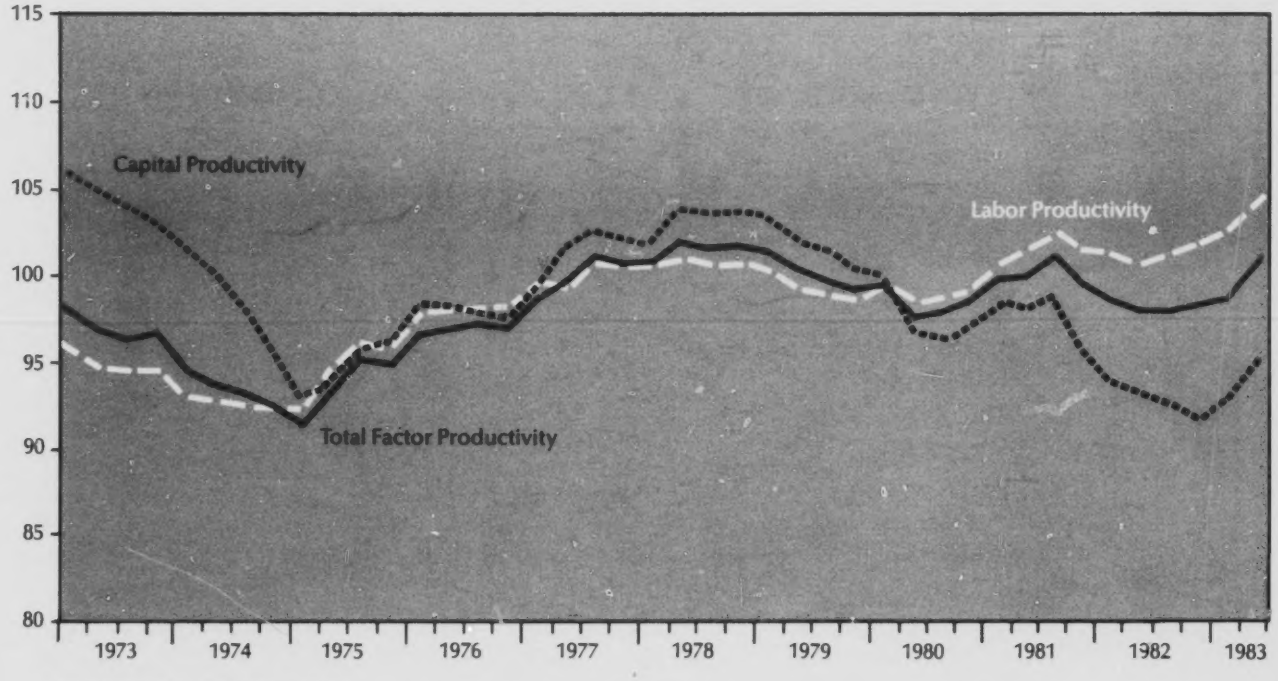
The year 1983 will be remembered as a year of puzzling contradictions. During the first half of 1983, the non-farm economy expanded at a strong 8.8 percent (annual rate). This spurt of growth led some economists to sound an alarm that the economy was expanding too rapidly. As the economy limped and then exploded out of the recession, unemployment peaked at a post-World War II record of 10.8 percent before sliding back below 9 percent.

With the surge in output, came an increase in labor productivity for the non-farm sector of 4.9 percent (annual rate) for the first half. As expected, labor productivity in the manufacturing sector of the economy showed an even healthier 8.2 percent increase in the first half.

For many companies the recovery came too late as the rate of corporate bankruptcy passed the all-time high set in 1932. Many individuals fared no better than organizations as the number of Americans officially living in "poverty" reached 15 percent of the total population.

But on the inflation front, the news of 1983 was nothing but good, with the price index expanding about 4.5 percent, despite the paradoxical fact that the federal government was running a record deficit. The presumed relationship between inflation and government red ink seemed to have been severed at least for the moment.

Figure 1: Productivity Trends In The U. S. Business Economy By Quarter: 1973-1983 II



Source: American Productivity Center

Even though interest rates fell sharply in the first half of 1983, they firmed up in the later half of the year at levels that many economists felt could jeopardize the recovery. The decline in interest rates was traceable to a change in Federal Reserve policy that moved the central bank away from its strict monetarist approach to controlling the money supply to a more flexible, interest rate sensitive approach. With real interest rates hovering at record high levels in this country, the dollar regained its strength on international currency markets while the U.S. trade deficit continued to be substantial.

The non-story of the year was oil. High prices and weak demand due to the recession left the international oil market glutted. OPEC, for the first time in its history, was forced to call a retreat and roll back prices in hopes of preventing a full scale rout on the price front. Saudi Arabian light crude, the benchmark for OPEC pricing, fell from $34 to $29 a barrel.

On the investment front, little apparent progress was made despite generous tax incentives and falling interest rates. Real business investment fell 5.7 percent in the first quarter of 1983. New residential investment, however, responded to falling interest rates with an annual increase of nearly 50 percent for 1983.

The tax incentives provided in President Reagan's Economic Recovery Act of 1981 for savings also proved to have only a temporary effect as personal savings as a percentage of disposable income fell to a near record low of 3.9 percent in the second quarter of 1983 from a 6.5 percent average for 1982.

The recovery of 1983 was fueled by increases in aggregate demand that came from consumers who seemed willing to reduce their personal savings and from the Pentagon. Consumers, in pursuit of the American dream of home ownership and new automobiles drove up personal consumption over 16 percent while spending by the Department of Defense rose nearly 15 percent over the previous year.

Sustaining an economic recovery will require coordinating U. S. economic policy with its world trading partners. Recovery in one country is no longer possible in a world economy that has become increasingly interdependent. While the economics of Japan, France and Italy remained in the doldrums of recession in the first half of 1983, Canada, West Germany and the United Kingdom showed signs of recovery.

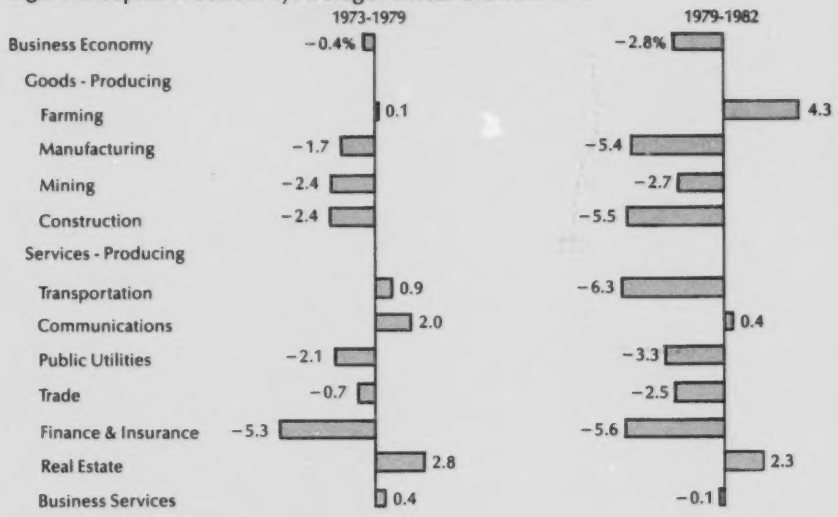
Despite recovery in parts of the developed world, the third world debt problem remained the major international threat to world recovery. In the last 10 years the level of outstanding indebtedness of the developing countries increased fivefold to over $650 billion, exceeding the net capitalization of the major western banks that made the now-questionable loans.

Capital Productivity

When the U. S. economy fell into recession in 1980, capacity utilization and capital productivity fell sharply. The reduction in the performance of capital has been one of the benchmark characteristics of all post-World War II recessions. The reduction in capital productivity in the 1979-82 period represented the longest sustained fall in capital productivity for all post-World War II recessions (Figure 2). Capacity utilization in manufacturing also suffered a severe decline, falling to a record low 68 percent after having risen to 84 percent as recently as 1978 (Figure 3).

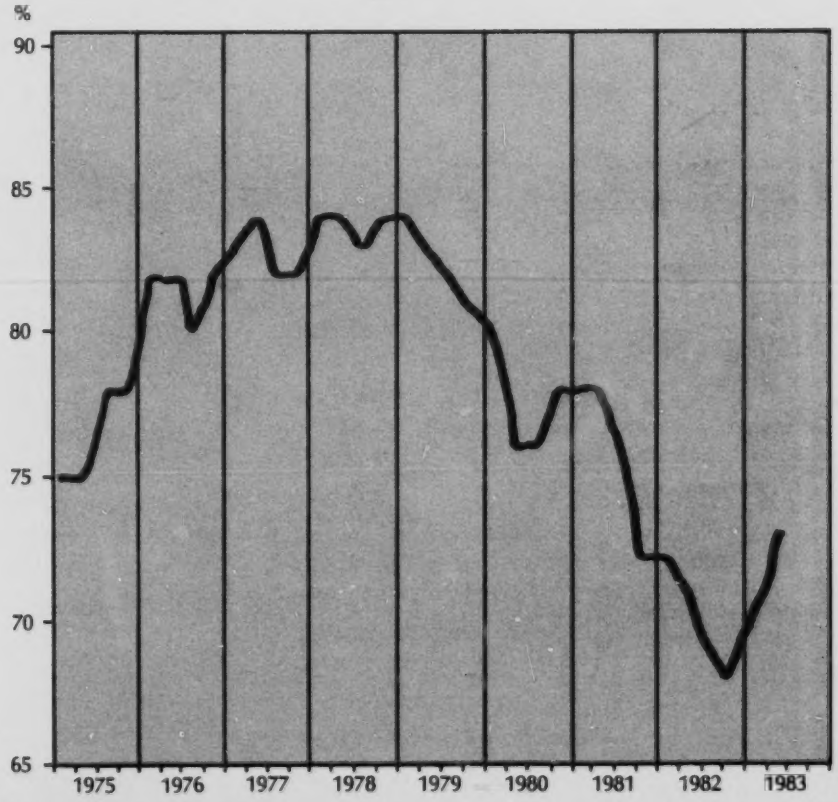
Recent difficulties in capital productivity trends are spread throughout the economy (Figure 2). In the 1979-82 period, the private business economy showed an average annual decline of 2.8 percent. This was exceeded by several of the individual sectors, such as manufacturing (−5.4 percent) and finance and insurance (−5.6 percent). The main sectors that improved in this period were farming, which is always subject to influences unrelated to the general economy, and somewhat surprisingly, business services. Business services includes such industries as hotels, consulting, repair and movies. (Manufacturing industry detail can be found in the Appendix, beginning page 19.)

Figure 2: Capital Productivity Average Annual Growth Rates



Source: American Productivity Center

Figure 3: Capacity Utilization In Manufacturing

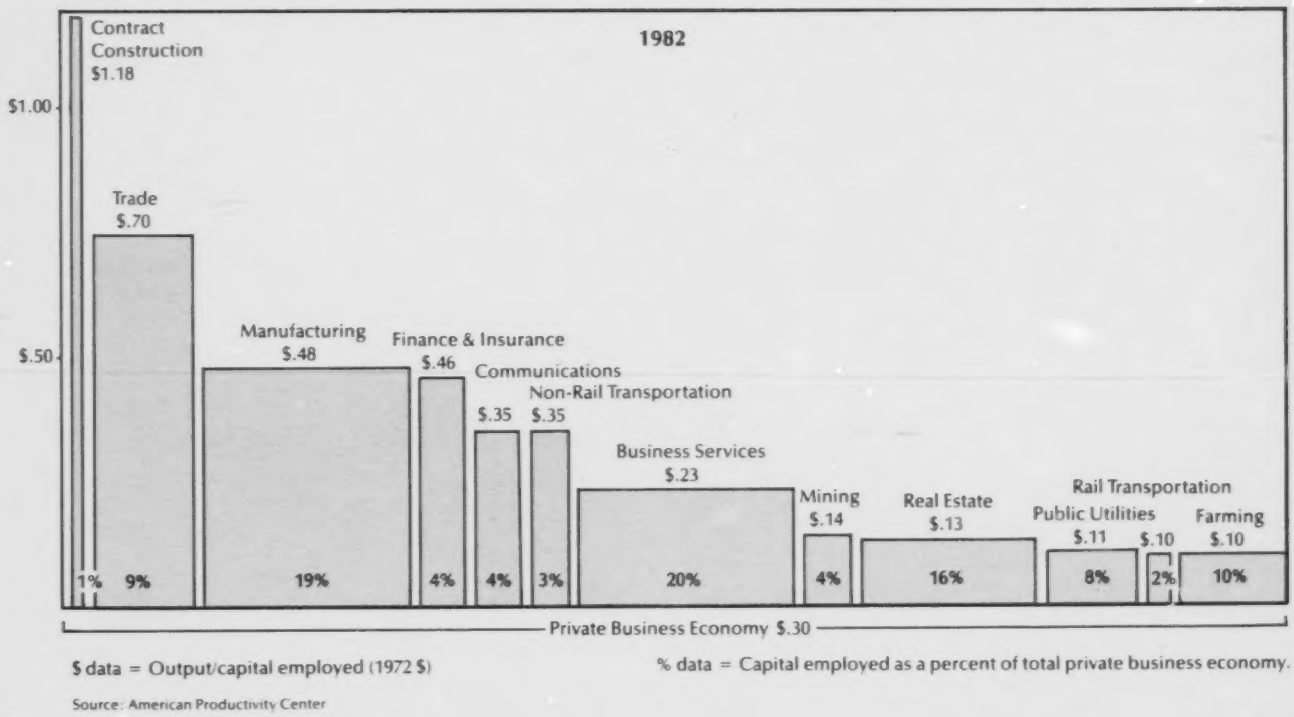


Source: U. S. Department of Commerce

Figure 4 presents a striking picture of the wide differences in *level* of capital productivity. The level of capital productivity does not basically indicate good or bad performance; it is mainly a statement of the level of capital intensity in different industries. Of course, it is possible to improve the utilization of capital assets by management efforts, but in the absence of more detailed information, a comparison of output per capital employed between industries in one time period must be viewed primarily as a statement about the inherent capital needs of that industry. Nevertheless, the capital productivity of contract construction and trade stand out as being substantially higher than the rest of the economy and manufacturing and finance/insurance, both normally viewed as "capital intensive" are well above the national average on capital productivity.

It is often asserted that the United States service industries have not made adequate use of capital, and that therein lies an opportunity for overall productivity improvement. Yet, business services, which is a collection of service industries, is already much more capital intensive than most other industries. Fully 20 percent of the capital in the private business economy is found in the business services category, one percent more than in all of manufacturing.

Figure 4: Capital Productivity Levels



Source: American Productivity Center

In Figure 5, the same capital productivity level analysis is applied to the components of manufacturing. The differences between apparel and leather, on the one hand, and petroleum and primary metals on the other are a multiple of 8. Unfortunately, the six manufacturing industries with the lowest capital productivity are significant industries, making up 51 percent of manufacturing capital. Most of the top performers are relatively small industries, not simply measured by capital requirement, but also by measures of output or labor input. It is an encouraging sign that several of the industries with the highest capital productivity are also those with the highest rate of output growth. Perhaps this is a sign that investments are gradually being allocated to the industries that will best use the investment money.

Since the fourth quarter of 1982, capital productivity has turned around (Figure 6). While this increase in capital productivity is encouraging, it should not lead us into complacency believing that our long term problem of declining capital productivity has been solved. In post-World War II recoveries capital productivity has shown an increase of as much as 8.2 percent in the first year as businesses expanded output using previously idle capacity. In spite of the recent surge in capital productivity, the overall level of capital productivity was 14 percent lower in mid-1983 in the manufacturing sector of the economy than it was in 1948.

Figure 6 raises other questions about the strength of the current recovery compared with previous recoveries. The performance of the current recovery after *six months* is approximately half of the "normal" *annual* performance of strong past upturns, and thus would appear to be right on track. However, viewing this recovery in comparison to relatively weaker recoveries in 1970 and 1980, it can be argued that most of the recovery has already taken place. It is widely recognized that labor productivity improves rapidly in the early stages of recovery because workers are not rehired until the signs of recovery are overwhelming and inventories are drawn down. But the same effect occurs in capital productivity, because capacity utilization also starts improving immediately once inventories are drawn back to normal.

Figure 5: Capital Productivity Levels, Manufacturing Industries, 1982

	Output / Capital Employed (1972$)	Output Growth (1979-82, ave. ann.)	% of Manufacturing Capital
Apparel	$1.30	−3.6%	1%
Leather	1.10	−0.6	—
Misc. Manufacturing	1.02	−2.2	1
Instruments	.89	2.5	2
Electrical Machinery	.81	0.1	7
Furniture	.79	−2.6	1
Tobacco	.75	−0.6	1
Printing & Publishing	.73	0.6	3
Food	.68	3.9	7
Rubber	.63	−2.9	3
Lumber	.57	−1.2	2
Fabricated Metals	.55	−5.0	6
Non-Electric Machinery	.52	−1.7	12
Textiles	.50	−3.6	3
Transportation Equipment	.48	−6.4	11
Total Manufacturing	**.48**	**−2.6%**	**100%**
Chemicals	.34	−0.6	11
Stone, Clay & Glass	.32	−4.5	4
Paper	.28	−3.1	6
Petroleum	.16	−7.2	6
Primary Metals	.16	−12.2	13

Source: American Productivity Center

Figure 6: Productivity Growth During Early Phase of Recovery

	% Increase—One Year Later		
Recession Trough	Labor Productivity	Capital Productivity	Total Factor Productivity
4Q'49	8.5%	11.1%	8.9%
2Q'54	5.6	5.6	5.7
2Q'58	4.4	8.2	5.4
1Q'61	5.5	4.4	5.2
4Q'70	3.7	2.1	3.1
1Q'75	5.5	6.0	5.7
2Q'80	2.6	1.4	2.2
4Q'82	2.0*	3.1*	2.3*

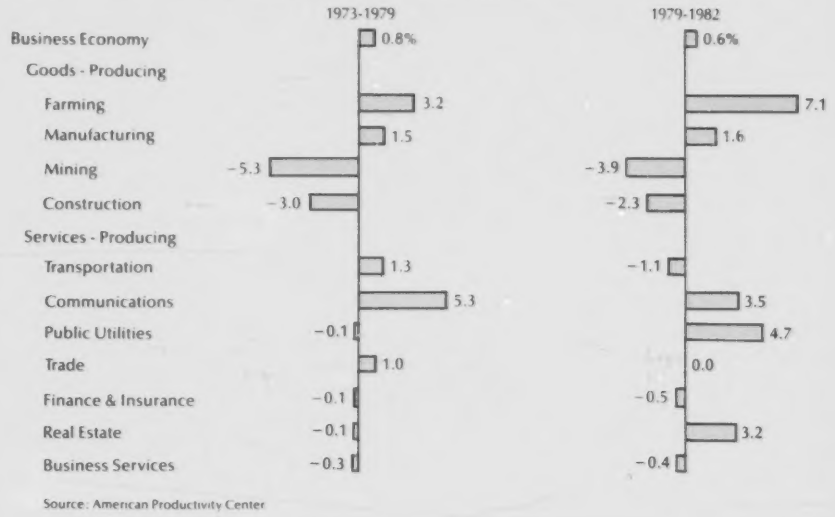
* 6 months later
Source: American Productivity Center

Labor Productivity

The more widely reported labor productivity statistics have also been weak in the last three years (Figure 7). The 1979-82 period showed notable declines in construction and mining industries, and smaller declines in several other industries. However, communications, public utilities, farming and manufacturing segments did well enough to carry the overall average to positive ground. (The results were also widely differing within the segments of the manufacturing industry as can be seen in the Appendix, page 19.)

Labor productivity *levels* for 1982 show the usual overlap between goods-producers and service-producers (Figure 8). The top three performers by an overwhelming margin are real estate, communications and public utilities, all considered services. Rail transportation also shows up well above average. Manufacturing, which ties with trade as the largest single user of hours, is also usually above average. Bringing up the rear are trade, farming, business services and contract construction.

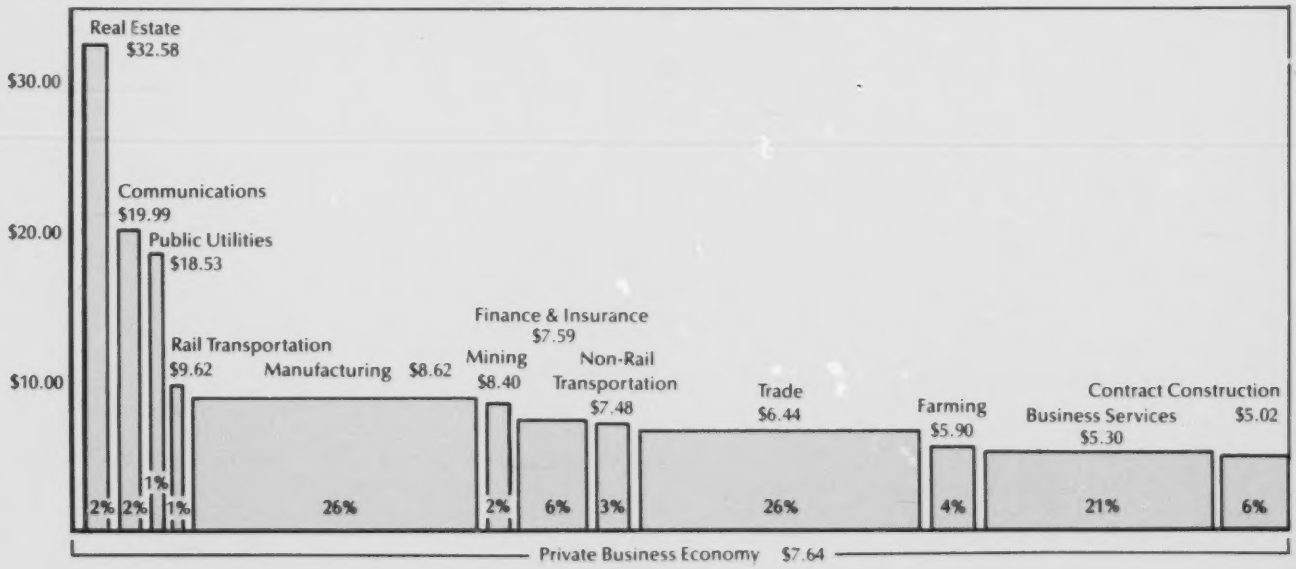
Figure 7: Labor Productivity (Average Annual Growth Rates)



Source: American Productivity Center

Within manufacturing, a similar dispersion occurs (Figure 9). The major process industries such as tobacco, petroleum and chemicals tend to show high labor productivity. The most labor intensive industries such as printing, furniture, apparel and leather range from 25 to 40 percent below the average of total manufacturing.

Figure 8: Labor Productivity Level, 1982



$ data = Output/hour (1972$)
% data = Hours as a percentage of total private business economy.

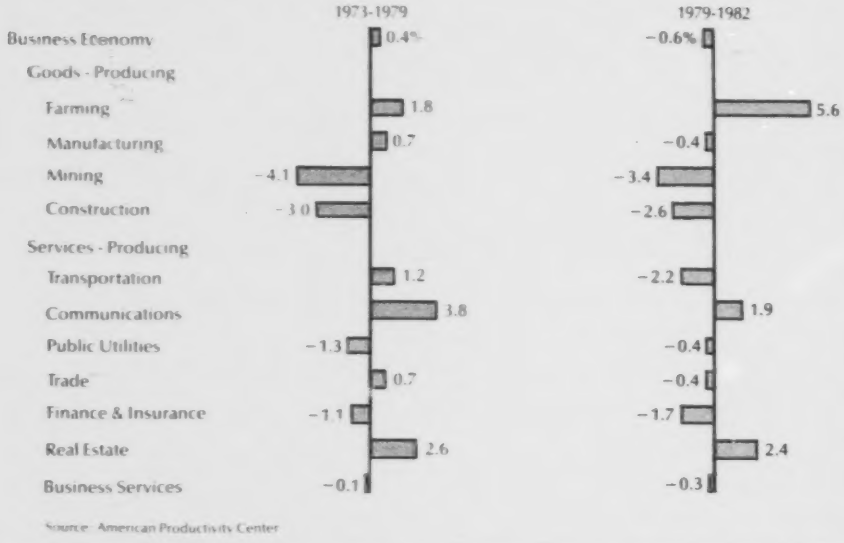
Source: American Productivity Center

Figure 9 Labor Productivity Level Manufacturing, 1982

	Output/ Hour (1972$)	% of Mfg. Hours
Tobacco	$30.40	0%
Petroleum	15.05	1
Chemicals	12.10	6
Food	10.47	9
Transportation Equipment	9.76	9
Electrical Machinery	9.39	11
Instruments	9.03	4
Non-Electric Machinery	8.96	12
Paper	8.81	4
Total Manufacturing	$8.62	100%
Primary Metals	7.83	5
Rubber	7.80	4
Stone, Clay & Glass	7.66	3
Fabricated Metals	7.44	8
Misc. Manufacturing	6.89	2
Lumber	6.87	3
Textiles	6.84	4
Printing & Publishing	6.57	7
Furniture	5.53	2
Apparel	5.41	5
Leather	5.30	1

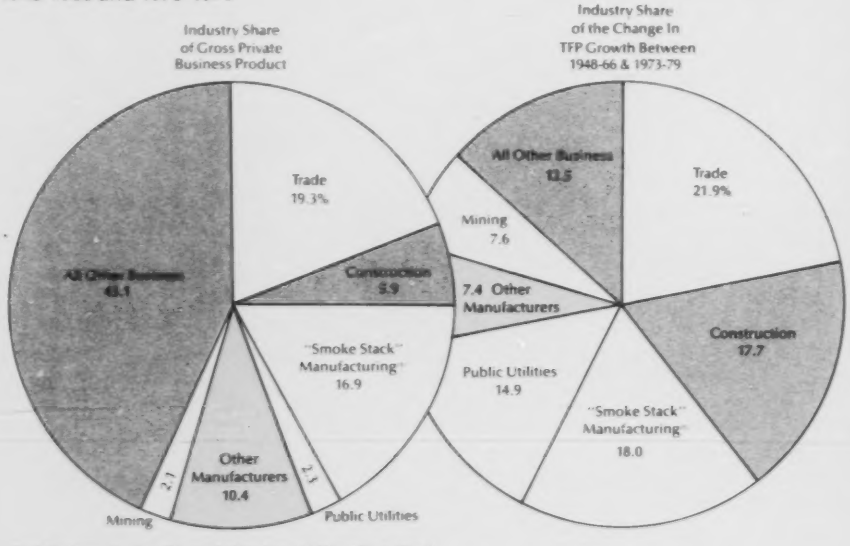
Source: American Productivity Center

Figure 10: Total Factor Productivity (Average Annual Growth Rates)



Source: American Productivity Center

Figure 11: Industry Group Contribution To Total Factor Productivity Slippage Between 1948-1966 and 1973-1979



*Includes Paper, Lumber, Chemicals, Petroleum, Rubber, Stone, Clay & Glass, Primary & Fabricated Metals, Non-Electric Machinery, and Transportation Equipment.

Source: Kendrick, John, *Interindustry Differences in Productivity Growth*, American Enterprise Institute, 1982

Total Factor Productivity

A look at the trends in total factor productivity, which represents a blend of labor and capital performance, indicates that the private business economy as a whole showed a modest decline over the period 1979-82 (Figure 10). The lowest performers were construction at −2.6 percent and mining at −3.4 percent. Most segments showed a minor decline, but farming, communications and real estate bucked the trend. (Manufacturing detail can be found in the Appendix, page 20.)

John Kendrick, in his recent publication for the American Enterprise Institute, has calculated which industries contributed the most to the total factor productivity slippage in the late 1970s. This is shown in Figure 11. The major contributor to the slippage in total factor productivity was trade, but trade only contributed slightly more than would be expected, given its proportion of the gross private business product. Viewed in terms of relationship between contribution to the productivity decline and share of gross product, the major problems were in construction and public utilities. Each of them contributed approximately twelve points more to the slippage than they did to gross product. Mining also weighed in with a substantial contribution to the slippage. The manufacturing area showed that "smokestack" industries, which might have been assumed to be major contributors to the slippage, actually contributed only very slightly more than "their share," and the other manufacturing industries contributed even less. This implies that public policy might need to concentrate on construction, public utilities, and to a lesser extent, mining if this late 1970s decline in total factor productivity is still a fair reflection of the economic problems ahead in 1984.

Capital Investment

Although there are many explanations as to why productivity advances or declines in a national economy, most commentators believe that the rate of capital investment plays a key role. In the United States, the composition of capital stock has "improved" in the last decade. That bodes well for improved long-term performance of U. S. productivity. Figure 12 demonstrates this link between major increases in U.S. capital stock and substantial progress in output and productivity performance. In the 1970-82 period, the computers and instruments categories expanded their investment base at double digit rates. The smallest increases in capital stock have been in basic industrial buildings and machinery, public utilities that generate energy and in non-automotive transportation. There is the basic question of which preceeded which — is investment following growth performance stars or is growth performance being caused by the investment? In either case, this Morgan Stanley data demonstrates that the more productive parts of the economy are growing the fastest in capital investment.

Figure 12 U.S. Net Capital Stock

	Composition		Average Growth/Year
	1970	1982	1970-82 (Constant $)
Basic Industrial			
Heavy Machinery	14.1%	12.2%	2.2%
Industrial Buildings	9.4	6.8	0.7
High Technology			
Electrical Machinery	7.4	9.7	5.9
Computers	1.5	5.4	14.9
Instruments	1.7	3.9	10.4
Communications	3.0	3.0	3.5
Energy			
Extraction	3.6	3.9	4.3
Generation	8.2	7.3	2.5
Transportation			
Motor Vehicles	5.8	6.2	4.2
Other Transportation	6.9	5.2	1.0
Miscellaneous*	38.4	36.4	3.0
	100.0	100.0	3.5

* Commercial, institutional and farm structures and equipment are main components.
Source: Morgan Stanley

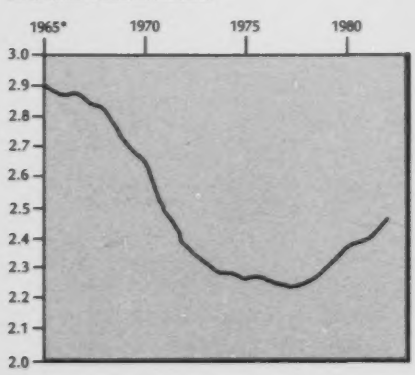
Research and Development

It is also generally agreed that high and increasing levels of research and development are associated with high growth in productivity. United States research and development as a percentage of gross national product has declined since the 1960s, although that decline leveled out in the late 1970s and there are signs of good increases in the early 1980s (Figure 13).

In addition to the relative decline in research expenditures in the 1970s, there is a shift in mix away from basic towards more applied and developmental research (Figure 14). Basic research is an original, unspecified investigation aimed at increasing knowledge. Such "blue sky" investigations are then explored for practical usage through applied research. When and if a practical application is identified, the development stage seeks to produce useful devices or processes. Although the quality and value of research ultimately depend upon the "success rate" and type of research undertaken, it is still fair to say that a deemphasis on basic research will have major negative effects in the long term.

There is also a recent reversal in who is performing research and development. (Figure 15). In the late 1950s industry was doing 78 percent of the research and development in this country; that had declined to 68 percent by 1975, although it has started to recover in this decade. The federal government and universities and non-profit organizations had increased to fill the industry gap but are now declining.

Figure 13: U.S. Research & Development, 1961-1982

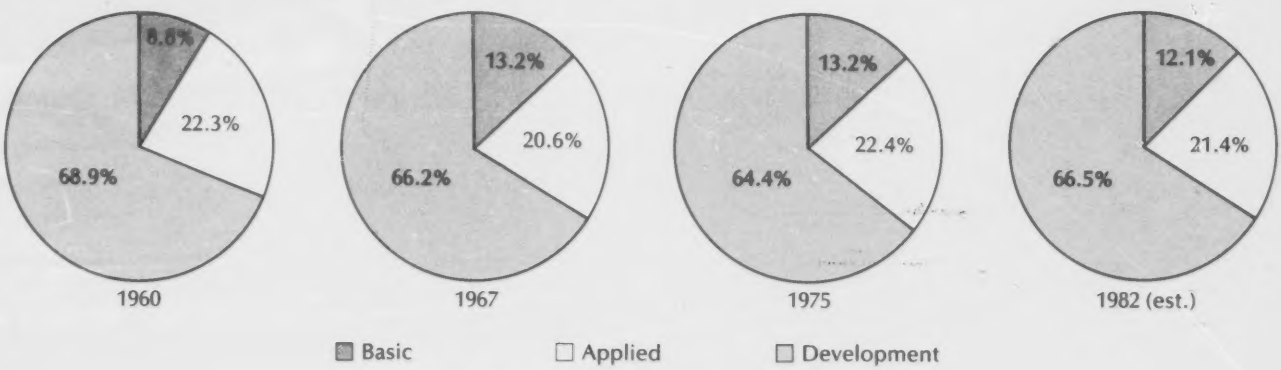


* estimated
Source: National Science Foundation

Business and Economic Cycles

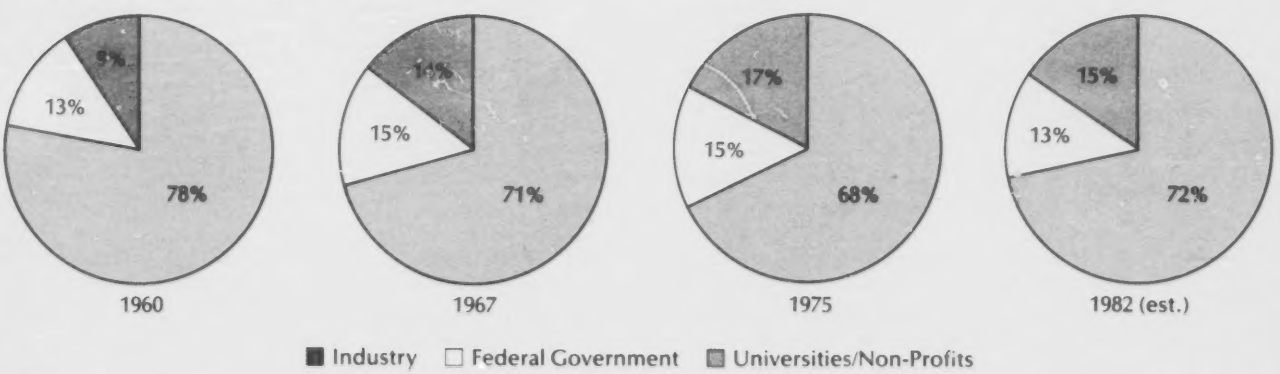
Upon first consideration, decisions to improve productivity through greater capital investment and research and development would seem to be largely the discretion of the nations' corporations. Obviously, however, such internal decisions do not exist in a vacuum and are influenced by a range of external economic factors. A key *short run* determinant of productivity performance is the business cycle. It has been demonstrated that labor and capital productivity increase rapidly in the early stages of a recovery. Business cycle conditions certainly have an indirect effect on productivity performance in many respects. Business investment plans, often considered the engine of productivity improvement, will be seriously impacted by poor short-run corporate performance. The will to invest is a function of the perceived business outlook, and as long as conditions look bad, investments will not be made. To some extent, research is viewed as a "luxury" item, and research budgets tend to be cut during hard times. Bad times are also a producer of general discontent and turnover in the employee ranks, which certainly is a depressant of productivity performance.

Figure 14: Composition of National Research & Development Expenditures



Source: National Science Foundation

Figure 15: Performer of Research & Development



Source: National Science Foundation

Another key determinant is the extent and composition of borrowing to finance the economy's growth. As the federal government and private sector find themselves competing for funds, the question arises will the necessary capital be available to finance the recovery through 1984? Overall borrowing as a percent of gross national product in the last two recoveries has peaked at 18 percent of gross national product (Figure 16). By the second quarter of 1983, U. S. borrowing had already reached 18 percent of gross national product. Private borrowing in the two previous recoveries registered 14 and 16 percent of gross national product, whereas private borrowing had only reached 10 percent by second quarter of 1983. In contrast, federal borrowing, which was two and four percent at previous recovery peaks, had reached eight percent by second quarter 1982 and likely has increased further since then. This constitutes an unprecedented level of federal borrowing coupled with reasonably strong private borrowing requirements coming.

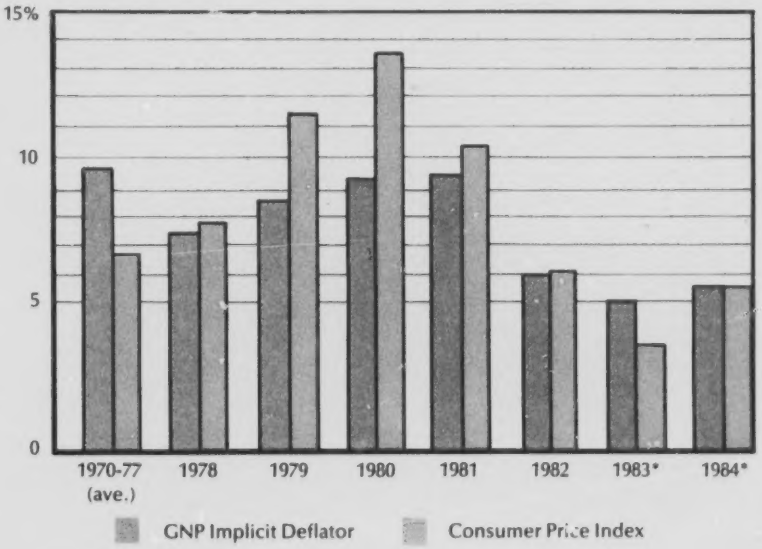
Inflation trends also have a significant influence on expenditure decisions affecting productivity growth. Recent drops in U. S. inflation statistics (Figure 17) have been widely and optimistically reported. What is less widely understood is that the two key indicators of inflation — the GNP implicit deflator and the CPI — show very different patterns. The GNP deflator shows a fairly steady and moderately high level of inflation (seven to nine percent) through the whole decade of the 1970s and into 1981, but it had fallen to six percent in 1982 and is estimated to be in the five percent range for the next two years. On the other hand, CPI, which in the early 1970s was six to seven percent, increased to double digit proportions in the 1979 to 1981 period. It had fallen to 6.1 percent in 1982 and may reach as low as three percent in 1983. The CPI is clearly a more volatile indicator. Some components of it are only slightly related to the issue of consumer-spending power.

Figure 16 Financing Economic Output (Borrowing as % of GNP)

	Private	+ Federal	= Total
1Q 1973 (Recovery Peak)	16%	2%	18%
1Q 1975 (Recession Valley)	7%	4%	11%
3Q 1977 (Recovery Peak)	14%	4%	18%
1Q 1982 (Recession Valley)	8%	3%	11%
2Q 1983 (Recovery in Progress)	10%	8%	18%

Source: Goldman Sachs

Figure 17: U.S. General Inflation Rates



*American Productivity Center estimates
Source: U.S. Department of Commerce

Figure 18: Specific Inflation (Annual % Increase)

	1978	1979	1980	1981	1982
CPI, Total	7.7%	11.3%	13.5%	10.3%	6.1%
Commodities					
Food	10.1%	10.9%	8.6%	7.8%	3.9%
Home Price	9.5%	13.4%	14.0%	5.3%	5.2%
Energy	4.6%	35.0%	38.6%	13.5%	−4.1%
Other	4.4%	2.8%	3.7%	7.1%	5.1%
Services					
Mortgage Interest	16.4%	28.1%	34.7%	22.0%	8.4%
Energy Services	9.0%	10.8%	17.1%	14.6%	13.9%
Other	5.4%	4.6%	6.8%	8.5%	8.0%

Source: Goldman Sachs

Both inflation itself and the expectation of further inflation have a great deal to do with the stimulation of productivity activity and general business conditions. But neither the GNP implicit deflator nor the CPI can be viewed as a consistently reliable indicator. Many industries find that their inflation patterns are quite divergent from those of the economy as a whole. For example, the differences in inflation performance between different indicators is accentuated when the components of the consumer price index are separated (Figure 18). The mortgage interest and energy product categories showed very high rates of inflation during the late 1970s and home prices, food, and energy services reached double digits. However, miscellaneous commodities and services categories showed rather modest rates of inflation. Whether inflation is a problem or not is largely dependent on the types of purchases involved.

The lesson for productivity analysts is that in removing the effects of inflation from productivity data, it can make a significant difference what adjustment factors are used. The petroleum industry experienced an inflation rate far exceeding that of either the CPI or GNP deflator during most of the 1970s. The real cost of electronics, on the other hand, actually dropped during that decade. In many instances, industries will find it necessary to develop their own deflators if they are to have a dependable guide for business decisions.

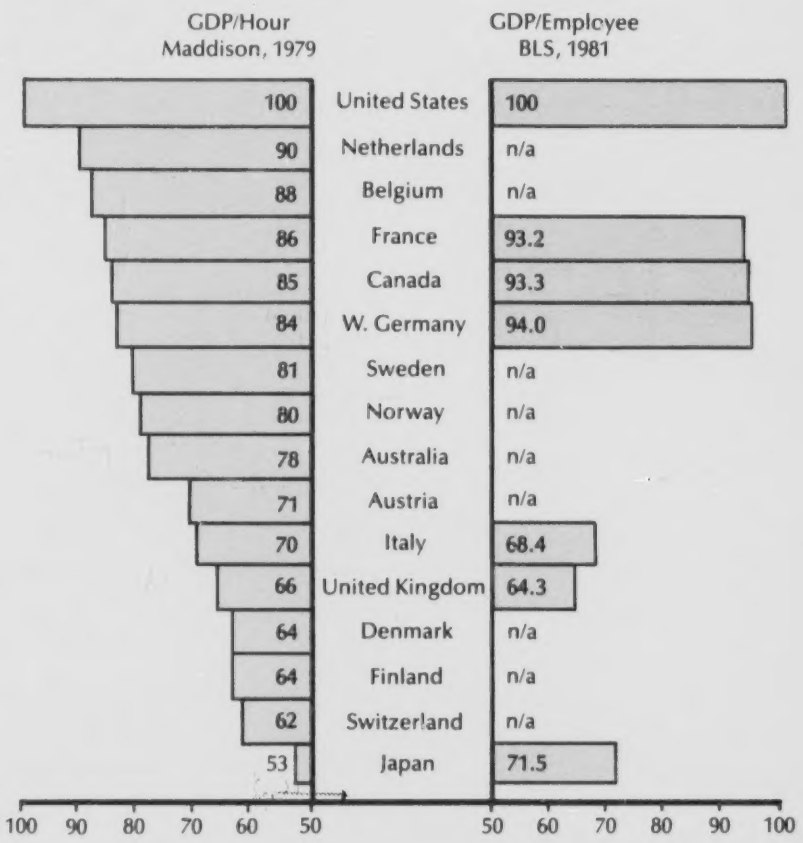
International Productivity Performance

Productivity Statistics

Although there is an encouraging increase in the magnitude of U.S. productivity statistics being published, there is still an extreme shortage of reliable data on other nations' performance. Figure 19 presents two approaches to productivity level, each of which can give useful information. One approach is gross domestic product *per employee*, published by the Bureau of Labor Statistics. Recent data is available with this index, but it covers only a relatively small number of countries. On this basis, setting the United States at 100 in 1981, it can be seen that Canada, France and West Germany are very close to the performance of the United States. Japan has reached 71.5 percent of U.S. level, and Italy and the United Kingdom are in the sixties.

The other approach to national productivity is gross domestic product *per hour*. This is a more accurate reflection of the true physical effort expended and covers a wider range of countries, but, unfortunately, data is available only sporadically. The latest complete set of data is that of Angus Maddison for 1979. In this data (again indexed against the U. S. at 100), only the Netherlands is as high as 90. Belgium and France are in the high eighties, but Denmark, Switzerland and Finland are in the low sixties. Japan, which was 71.5 percent by the BLS measure, is only 53 percent of the United States on the Maddison measure. This is because the Japanese work substantially longer hours than U.S. workers.

Figure 19: International Productivity Levels



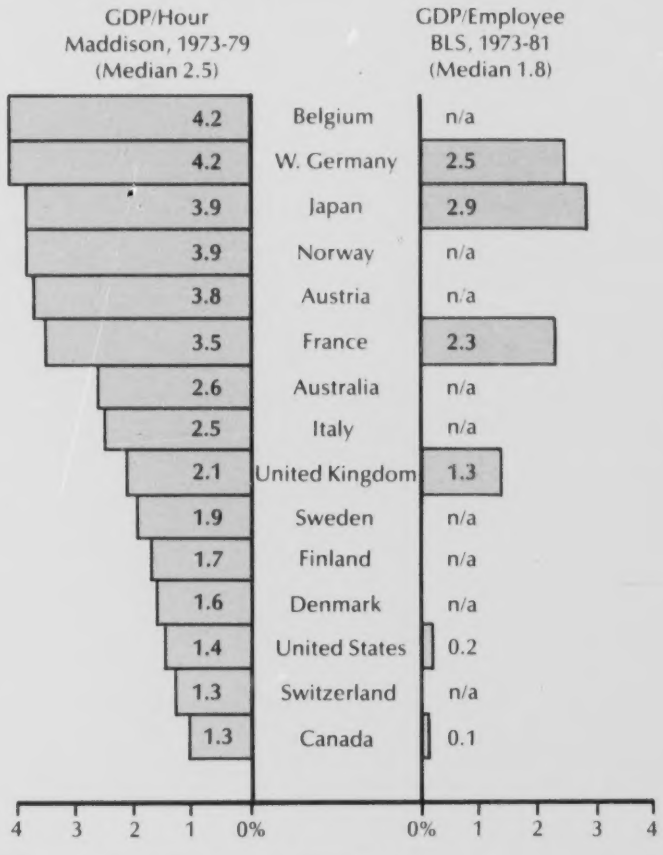
Source: Angus Maddison; Bureau of Labor Statistics

The same sources are available for measuring productivity trends (Figure 20). The BLS approach has produced lower numbers than the Maddison series in the recent past, probably reflecting further slippage for most countries in hours per employee. Although Japan is noted for its growth performance in the fifties and sixties, its record in the 1973-79 period is only slightly better than that of most European countries and is actually exceeded by West Germany and Belgium in Maddison's statistics. Notably behind the performance of West Germany, France and Japan are several European countries (Denmark, Finland, Sweden and Switzerland) as well as the U.S. and Canada.

Looking just at the manufacturing sector instead of the economy as a whole, the patterns for 1973-82 are similar in both series. (Figure 21). The performance of Japan remains outstanding at 6.2 percent. Most European countries are in the four and five percent range, and Sweden, United States and Canada bring up the rear.

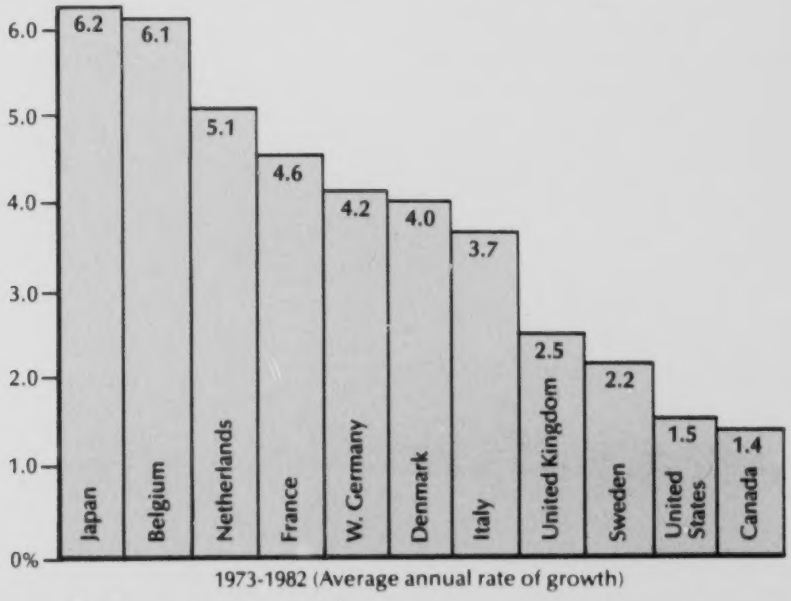
Other data, developed by the American Productivity Center in cooperation with the Japan Productivity Center, takes a more in-depth look at the productivity performance of Japan and the United States during the period 1970 to

Figure 20: International Productivity Growth



Source: Angus Maddison; Bureau of Labor Statistics

Figure 21: International Manufacturing Productivity



Source: Bureau of Labor Statistics

1980. In all segments, Japan out-performed the United States in labor productivity trends (Figure 22). In total factor productivity trend, the comparison is more mixed, because overall Japanese capital productivity declined at three percent per year during the decade. This raises an interpretation question of whether Japan's apparently "excessive" capital investment is simply the seed capital that fuels future labor productivity growth or is "over-investment" that would not have been entirely necessary.

The data makes clear that Japan has not outstripped the U. S. in all industries; some segments of the Japanese economy have a higher *level* of productivity than their American counterparts and some register a substantially lower level. The general rule is that the Japanese do well in export-oriented manufacturing products and do relatively poorly in their service industries and nonexport manufacturing (Figure 23).

Figure 22: Productivity, United States & Japan
Average Annual Productivity Growth, 1970-80

Industry Segment	Labor Productivity U.S.	Labor Productivity Japan	Total Factor Productivity U.S.	Total Factor Productivity Japan
Private Domestic Business	1.2%	5.3%	0.6%	2.3%
Agriculture	1.1	5.7	−1.3	−5.0
Nonfarm-Nonmanufacturing				
Mining	−3.5	8.7	−2.5	4.6
Construction	−2.4	0.7	−2.3	−1.4
Transportation & Communication	3.5	3.9	2.8	3.2
Electricity, Gas & Water	1.4	3.5	−0.5	−0.1
Trade	1.4	4.6	0.8	2.3
Finance & Insurance	0.0	6.0	−0.5	4.4
Business Services	−0.1	0.6	−0.1	−2.6
Manufacturing				
Food & Tobacco	3.5	6.4	2.7	2.4
Textiles	3.3	6.4	2.7	4.4
Pulp & Paper	3.0	6.0	1.9	2.3
Chemicals	3.8	10.5	2.5	6.8
Primary Metals	0.4	9.5	−0.2	5.0
Fabricated Metals	1.7	3.6	0.9	2.5
Machinery Exc. Elec.	1.6	7.1	1.0	5.8
Electrical Machinery	4.0	17.0	3.3	14.2
Transportation Equipment	2.6	7.1	1.5	4.8
Other Manufacturing*	2.3	3.0	1.3	1.1

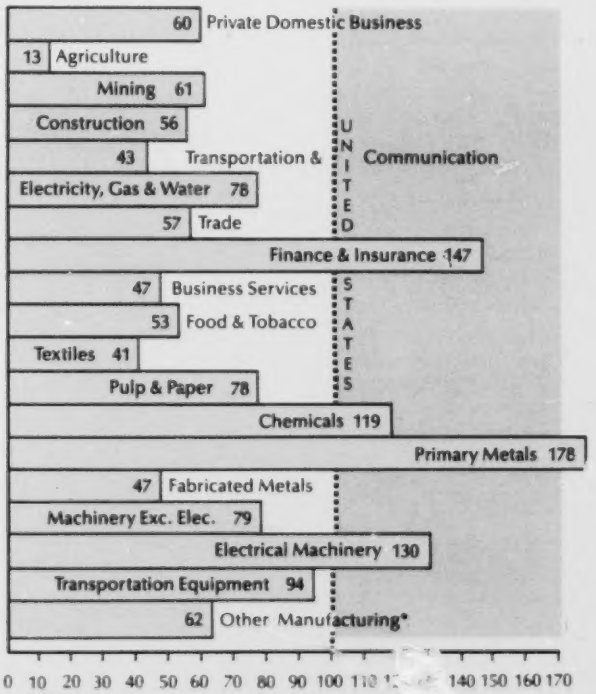
*Includes Apparel; Lumber; Furniture; Printing & Publishing; Petroleum; Stone, Clay & Glass; Leather; Instruments; and Miscellaneous Manufacturing.

Other Economic Indicators Related to Productivity

A number of international economic factors affect productivity performance and the dispersion among the industrial countries. Among these are the comparative strength of currencies, the recent economic recession, and comparative contributions to research and development, savings and capital formation.

The substantial strength of the U.S. dollar during the last few years has placed a strain on American profits — dampening exports and the performance of companies' international units. The U.S. dollar has gained more than 30 percent in comparison to all major currencies except the Yen (Figure 24). This makes U.S. export performance more difficult, and these difficulties are highlighted in Figure 25 which shows that the United States gap between exports and imports is among the widest of the industrialized countries in 1982. The United States, France and Italy all are performing in the range of .83 to .85

Figure 23: Relative Japan Levels of Labor Productivity



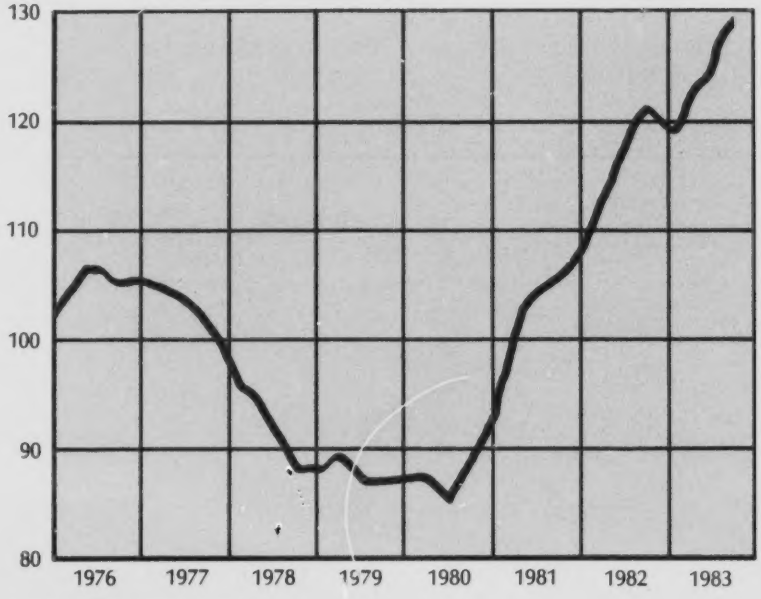
*Includes Apparel; Lumber; Furniture; Printing & Publis... Petroleum; Stone, Clay & Glass; Leather; Instruments; and Miscellaneous Manufacturing.

Source: American Productivity Center

export to import ratios. The other major industrial countries are either in a balanced position (United Kingdom, Netherlands and Japan) or in a fairly substantial surplus (Canada and West Germany). In light of the dollar's strength and the resulting trade imbalance, the strength of the current U. S. recovery is particularly impressive.

The statistics in Figure 26 demonstrate that the whole world showed recessionary aspects in 1981 and 1982. Only Japan showed substantial GNP growth, low levels of inflation and low unemployment. But even Japan's GNP could not sustain its growth of previous years. The United States was more successful at containing inflation than other countries except Japan, Netherlands and West Germany. But, the United States unemployment record did not hold up as well. Only the United Kingdom was clearly "behind" the United States in this regard.

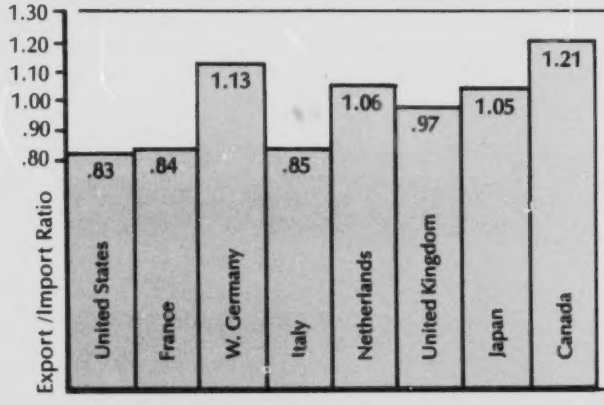
Figure 24: U.S. Dollar-Weighted Exchange Rate



Index: 1973 = 100

Source: U. S. Department of Commerce

Figure 25: International Balance of Trade (1982)



Merchandise Exports (FOB)		Merchandise Imports (CIF)
$212.2	United States	$254.9
96.7	France	115.7
176.5	W. Germany	155.4
74.0	Italy	86.8
66.2	Netherlands	62.6
96.9	United Kingdom	99.7
138.9	Japan	132.0
68.2	Canada	56.3

*$ Billions

Figure 26: World Economic Factors

	GNP Growth		Inflation (GNP Deflation)		Unemployment	
	'81	'82	'81	'82	'81	'82
United States	2.6	−1.9	9.4	6.0	7.6	9.7
France	0.3	1.6	12.0	12.5	7.8	8.4
W. Germany	−0.2	−1.1	4.2	4.7	5.5	7.5
Italy	0.1	−0.3	18.3	17.5	4.2	4.8
Netherlands	−0.8	−1.6	5.7	5.9	7.4	10.1
United Kingdom	−2.1	2.2	11.9	7.8	10.0	11.7
Japan	3.8	3.0	2.5	2.1	2.2	2.4
Canada	3.4	−4.4	10.6	10.1	7.6	11.0

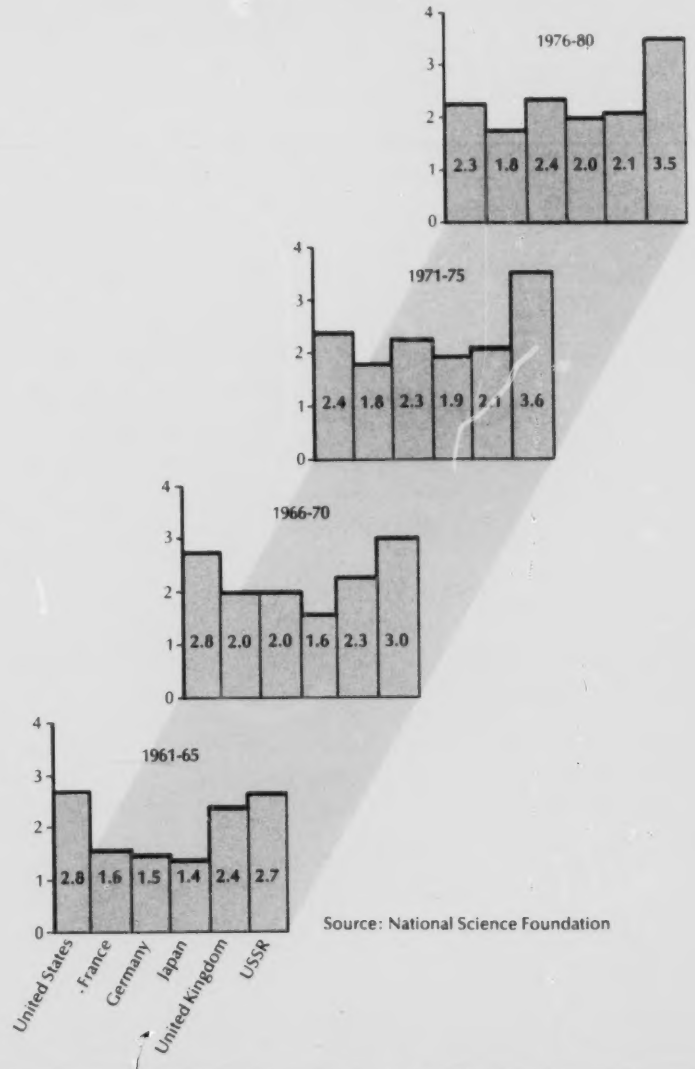
Source: U. S. Department of Commerce

In comparative research and development, only the United States has seen a decline in research and development as a percent of GNP since the early 1960s. All other major countries, except the United Kingdom, have shown good to substantial increases in this ratio (Figure 27). The USSR continues to invest a higher proportion of its GNP in research and development, and Germany is also slightly ahead of the United States. France, Japan and the United Kingdom are now in approximately the same range as the United States, although in the early 1960s they were lagging very far behind.

In savings and investment, the United States continues to save a much smaller percentage of its disposable personal income than other industrial countries. As a corollary, its capital formation as a percent of GNP ratio ranks low (Figure 28). In the latter statistics, the United States is joined by the United Kingdom in having low performance, and several other countries are not too far ahead. Most countries group in the 19 to 20 percent range compared to the United States' 16.5. Japan, by contrast, has a capital formation rate of nearly 30 percent.

It is impossible to convey the true scope of international competition in a small chartbook, but it is certainly clear that any claims by the United States of economic superiority face strong challenge from several nations around the world. The current problems are problems of the whole world. All countries have been hurt by this recession. But it is worth noting that *all* industrial countries will likely pull out of the recession at a fairly rapid pace. So this is no time for complacency on the part American decisionmakers. The need to compete is still there and time is passing.

Figure 27: Comparative Research and Development (R&D as % of GNP)



Source: National Science Foundation

Figure 28: International Savings & Investment

	1982 Savings as % of Disposable Personal Income	Capital Formation as % of GNP
United States	5.8%	16.5%
France	15.5	20.5
W. Germany	14.4	20.5
Italy	25.7*	19.2
Netherlands	13.1*	18.3
United Kingdom	12.0	15.4
Japan	19.8*	29.6
Canada	15.1	21.8

* 1981 data

Source: U. S. Department of Commerce

APPENDIX

Table 1: Productivity Trends in the U.S. Business Economy

	Total Factor Productivity	Output per Unit Labor	Output per Unit Capital
1973 I	97.8	95.6	106.0
1973 II	96.9	94.8	104.9
1973 III	96.3	94.3	104.0
1973 IV	96.4	94.5	103.8
1974 I	94.4	92.8	101.2
1974 II	94.1	92.8	100.1
1974 III	93.2	92.2	98.3
1974 IV	92.4	92.1	95.9
1975 I	91.4	92.1	92.6
1975 II	93.4	94.6	93.8
1975 III	95.0	96.0	95.7
1975 IV	94.9	95.7	96.0
1976 I	96.6	97.2	98.2
1976 II	96.8	97.6	98.1
1976 III	97.0	97.9	98.0
1976 IV	97.0	98.0	97.9
1977 I	98.6	99.4	99.5
1977 II	99.6	99.6	101.2
1977 III	101.1	100.9	102.3
1977 IV	100.9	100.5	102.0
1978 I	100.9	100.5	101.9
1978 II	101.7	100.8	103.9
1978 III	101.5	100.6	103.7
1978 IV	101.6	100.7	103.9
1979 I	101.2	100.2	103.4
1979 II	100.3	99.6	102.0
1979 III	99.7	99.0	101.4
1979 IV	99.3	98.9	100.4
1980 I	99.4	99.3	100.0
1980 II	97.8	98.5	96.7
1980 III	97.9	98.9	96.2
1980 IV	98.3	99.1	97.0
1981 I	99.7	100.5	98.3
1981 II	100.0	101.1	98.1
1981 III	101.0	102.3	98.6
1981 IV	99.3	101.2	95.9
1982 I	98.6	101.1	94.0
1982 II	98.0	100.7	93.2
1982 III	98.0	101.1	92.5
1982 IV	98.2	101.9	91.6
1983 I	98.8	102.5	92.2
1983 II	100.5	103.9	94.4

Source: American Productivity Center

Table 2: Capital Productivity Trends for Manufacturing Industries

	Average Annual Rates of Change	
	1973-79	1979-82
Manufacturing	−1.7%	−5.4%
Food	−1.9	1.7
Tobacco	−1.3	−6.8
Textiles	1.1	−3.7
Apparel	−0.3	−2.6
Lumber	−3.3	−8.2
Furniture	0.4	−6.2
Paper	−3.1	−6.2
Printing & Publishing	−2.4	−3.8
Chemicals	−1.1	−5.0
Petroleum	−4.1	−9.2
Rubber	−2.3	−3.0
Leather	−1.9	−2.7
Stone, Clay & Glass	−2.3	−7.9
Primary Metals	−4.2	−14.9
Fabricated Metals	−2.3	−6.5
Machinery, exc. Elec.	−1.3	−4.6
Electrical Machinery	0.5	−2.8
Transportation Equipment	−2.1	−12.6
Instruments	0.3	−1.1
Miscellaneous Manufacturing	0.3	−4.9

Source: American Productivity Center

Table 3: Labor Productivity Trends for Manufacturing Industries

	Average Annual Rates of Change	
	1973-79	1979-82
Manufacturing	1.5%	1.6%
Food	0.6	5.6
Tobacco	2.6	−2.4
Textiles	4.5	4.0
Apparel	3.5	3.1
Lumber	1.4	2.2
Furniture	3.9	−0.2
Paper	1.3	0.3
Printing & Publishing	−0.8	−0.3
Chemicals	2.5	−0.8
Petroleum	−1.9	−5.5
Rubber	0.0	2.5
Leather	1.6	4.3
Stone, Clay & Glass	0.9	1.6
Primary Metals	−1.3	−2.5
Fabricated Metals	1.3	1.8
Machinery, exc. Elec.	1.3	3.7
Electrical Machinery	3.8	3.3
Transportation Equipment	1.0	−2.8
Instruments	1.2	4.4
Miscellaneous Manufacturing	2.2	3.4

Source: American Productivity Center

Table 4: Total Factor Productivity Trends for Manufacturing Industries

	Average Annual Rates of Change	
	1973-79	1979-82
Manufacturing	0.7%	−0.4%
Food	0.1	4.6
Tobacco	0.3	−5.2
Textiles	3.7	2.0
Apparel	3.1	2.3
Lumber	0.2	−1.1
Furniture	3.3	−1.3
Paper	0.0	−1.9
Printing & Publishing	−1.2	−1.1
Chemicals	1.2	−2.6
Petroleum	−3.3	−7.9
Rubber	−0.5	1.3
Leather	1.2	3.2
Stone, Clay & Glass	0.1	−1.3
Primary Metals	−2.0	−6.3
Fabricated Metals	0.8	0.2
Machinery, exc. Elec.	0.8	1.6
Electrical Machinery	3.2	2.0
Transportation Equipment	0.2	−5.9
Instruments	0.9	2.7
Miscellaneous Manufacturing	1.9	1.5

Source: American Productivity Center

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